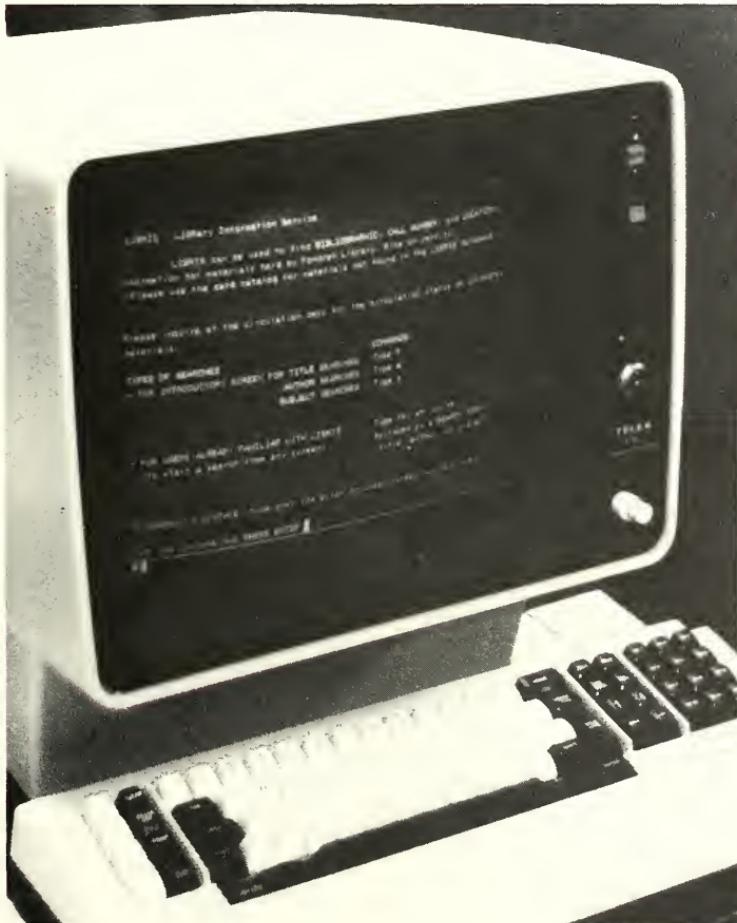


The Flyleaf

Friends of Fondren Library Vol. 36, No. 3

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RICE UNIVERSITY FONDREN LIBRARY

Founded under the charter of the university dated May 18, 1891, the library was established in 1913. Its present facility was dedicated November 4, 1949, and rededicated in 1969 after a substantial addition, both made possible by gifts of Ella F. Fondren, her children, and the Fondren Foundation and Trust as a tribute to Walter William Fondren. The library recorded its half-millionth volume in 1965; its one millionth volume was celebrated April 22, 1979.

FRIENDS OF FONDREN LIBRARY

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THE FRIENDS OF FONDREN LIBRARY

The Friends of Fondren Library was founded in 1950 as an association of library supporters interested in increasing and making better known the resources of the Fondren Library at Rice University. The Friends, through members' dues and sponsorship of a memorial and honor gift program, secure gifts and bequests and provide funds for the purchase of rare books, manuscripts, and other materials which could not otherwise be acquired by the library.

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T H E F L Y L E A F

Founded October 1950 and published quarterly by The Friends of Fondren Library, Rice University, P.O. Box 1892, Houston, Texas 77251, as a record of Fondren Library's and Friends' activities, and of the generosity of the library's supporters.

Editor, Elizabeth Dabney; Editorial Committee, Samuel Carrington, Connie Erickson, Diana Hobby, Margaret Clegg, Feme Hyman, Nancy Rupp.

Photographs by Elizabeth Dabney and Mary Lou Margrave

A LETTER TO THE FRIENDS

Dear Friends,

As I write to you, it is hard to believe that over seven years have elapsed since I first entered the labyrinth of librarianship as Rice's fifth University Librarian (my predecessors being Miss Alice Dean, Dr. William Dix, Professor Hardin Craig, Jr., and Mr. Richard O'Keefe). Little did I realize or fully appreciate the labor intensive complexities associated with acquiring, processing, and providing access to the information needed to support the University's (Rice, not Texas) research and instructional programs. Nor in my naivete did I realize how far behind both in planning and execution the Fondren was with regard to the available or rapidly developing library technologies.

With few exceptions, the library operated with procedures, methods, technologies, etc. similar to those which were in place when the building opened in 1948. Cataloging was laborious and done manually; there was a six month backlog of books to be cataloged; the semi-automated circulation system (one could consider it at the time as a museum piece) had long since given up the ghost, and the staff had reverted to an ineffective manual check-out procedure; the Fondren did not possess any machine-readable catalog records for its some 990,000 volumes; the FY 1978-1979 book budget of \$630,000 was theoretically overcommitted by \$300,000, primarily because of outstanding orders placed in prior years; microform equipment was obsolete and worn out, and many of the microforms themselves were housed in shoe boxes; the book endowment, made up of thirteen funds, was valued at just under \$200,000; there were no systematic efforts for bibliographic instruction; and who had heard of audiovisuals in the Fondren.

A few bright spots existed: the Board of Governors and the Rice Administration reiterated to me their strong commitment to the library and its service programs; there was a dedicated core of professional and paraprofessional librarians prepared and enthusiastic to undertake the challenge of modernizing and streamlining operations; and, equally important, there were the moral and financial support and goodwill of the Friends of Fondren (then composed of some 250 memberships and without a paid executive director) — a loyal and dedicated organization instrumental in helping the Fondren achieve so many of its milestones in the past.

In the intervening seven years Rice's library has taken the quantum leap from the proverbial Stone Age of the 1950's to the emerging Age of Information. The book budget has increased almost threefold; with fourteen new funds, the book endowment had on June 30, 1985 a market value of \$1,457,068, and during the current fiscal year another \$125,000 in donations have already been added to this amount; the backlog in cataloging current monographs is non-existent. This last achievement was

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accomplished in large part by Rice's joining in 1979 a bibliographic network and thereby have access to the database of some 13 million unique bibliographic records of the Online Computerized Library Center, Inc. (OCLC) in Dublin, Ohio. In 1978-1979 21,276 volumes were added to the collection; this figure jumped to 45,902 last year — the equivalent of almost one mile of shelving.

The most ambitious project undertaken by the Rice Administration was funding, beginning in 1981, an automation project which is presently being brought to completion with the implementation of the NOTIS integrated library system, whose database will contain in machine readable form all of the Fondren's cataloged material. In addition, the library staff has worked closely with the research faculty to develop detailed, computerized collection development profiles which permit vendors to expedite to the library research material falling within the established parameters. The staff has also developed an internal fund management system which enables the librarians to monitor and manage the book budget, to project with a fair degree of accuracy inflation rates for the various disciplines, and to adjust allocations according to the evolving needs of students and faculty.

With this modernization and streamlining of operations and its accompanying efficiency and cost effectiveness has come a significant increase in public services to the Rice and Houston communities. For a number of years the reference librarians have been offering to undergraduates a successful library research techniques course through Jones College; library workshops tailored for the more specialized needs of graduate students in the various academic schools continue to be popular; and individualized training is offered on how to conduct effectively a computerized bibliography search into some 400 specialized databases available to faculty and students. With the purchase of Shakespeare's plays on video cassettes last year, the Fondren began a modest audio-visual program whose focus is to supplement classroom instruction, and the librarians are currently working with faculty to augment the collection.

Over the years Rice's library has become in the minds of Houstonians the area's premier research library — and rightly so given the richness of the collections. The Board of Governors, President Rupp, and the Fondren staff feel a responsibility and strong commitment to share the wealth of our information resources with the community beyond the hedges. R.I.C.E., one of the largest and most successful fee-based information brokerages in the nation associated with a research library, fills several thousand requests received each month from corporations and individuals. The Division of Government Publications is a depository for federal and state documents and also obtains documents to support many of the programs in the Texas Medical Center. It is also the only patent repository in the area. Recently, after an inspection, the Government Printing Office awarded the Division a coveted Certificate of Merit (the inspector stated to me that she had only given five such certificates in over three hundred inspections).

Last but certainly not least, KUDOS must be accorded to you, the Friends of Fondren Library. Unlike universities in general, their schools and academic departments, libraries do not have a built-in constituency of alumni from whom to draw support. During the past seven years you have defied this national trend, and your accomplishments have been spectacular. In 1979 you provided funds for the capital costs (computer terminals, modems, etc.) associated with the Fondren's joining the OCLC bibliographic network. Your successful fund drive to renovate the third floor lobby (now the Sarah Lane Lounge) has provided a beautiful facility, heavily used by students for study and sometimes sleeping. The Friends of Fondren Endowment, established through the generosity of Mr. and Mrs. H. Malcolm Lovett, has increased 1,500% and as of June 30, 1985 had a market value of \$193,394. Contributions to your gifts and memorials program have more than doubled and hover around \$70,000 annually. Individually and collectively, you have also been instrumental in channeling other endowed funds to the Fondren. Another remarkable achievement is the fact that you as Friends devote a significant percentage of your operating budget, derived from dues, to buy additional books to support the University's program.

For a number of years it has been University policy that endowed income and monetary gifts to the Fondren do not figure in the operating budget but rather are dedicated to the purchase of material which gives that measure of excellence to the collection not possible through the operating budget. Disciplines enhanced in this manner include the Jones and Shepherd Schools, computer science, bio-engineering, and art history. In addition the Fondren has acquired or is in the process of acquiring on microfilm all English and American publications before 1801, Confederate imprints, nineteenth century American periodicals and novels, Society of Petroleum Engineers Papers, and a five year backfile of the NYSE 10K reports.

However, financial support is only a part of your role as boosters of Rice's library. Numbering now nearly 1,000 memberships which translates into over 1,500 members, you serve as ambassadors for the library and its many services. Through your goodwill and varied programs you draw positive attention to the important role which the Fondren and Rice are playing on campus and beyond the hedges. My association with you has been a personally rewarding experience. I take this occasion to salute you for your outstanding work and commitment, and I look forward to a continued close relationship in the years ahead.

Before looking to the future, three last developments should be brought to your attention. In 1984 the Board of Governors voted a large sum of money for the creation within existing space of the Alice Pratt Brown Library. Intended as a tribute to Mrs. Brown and her many contributions to the fine arts community and to Rice, this handsome facility was designed by Friend of Fondren Ralph Anderson of the architectural firm Crain/Anderson and will house the art, architecture, and music collections.

The Brown Library will be completely operational by the beginning of the summer.

The second development also involves space — the availability of which is becoming scarce for the shelving of books, a problem even more acute in other research libraries. With approved funding from the Board of Governors, the library staff is solving the problem in three ways: high density storage of little used, older periodicals; converting certain backruns of periodicals to microfilm; narrowing the stack aisles a few inches for an approximate gain of 25% in shelving capacity. Other plans under consideration include recovering control of significant areas of the building now reserved for non-library functions, compact storage for semi-rare pre-twentieth century monographs, and selective expansion of the microform storage program for certain periodicals.

The final but by no means least important development is the approval by the Board of Governors of a plan for the complete renovation of the building; efforts are currently under way to raise funds from outside sources for this ambitious project. The 1968 expansion of the building provided little in modernizing the 1948 part of the facility. Since 1968 and even more so since 1948, the library's physical arrangement and amenities have not kept pace with the spectacular growth of the University — both in terms of large increases in faculty and students and in terms of the new programs added to the various curricula. The renovation will not be a quick-fix, cosmetic one. With the participation of librarians and selected members of the Rice community, an architect will devise a master plan which will take into consideration efficient space utilization given Rice's present and projected future library requirements as well as present and future library technologies. In addition close attention will be paid to the amenities and aesthetics of the public areas.

What does this future portend for us as Rice moves more and more into the new Age of Information? What will be the role of the Fondren in this future, and how can what is viewed by its detractors as a monolithic campus institution keep pace with and adapt to this rapidly advancing evolution? In his 1984-1985 annual report, Richard De Gennaro, Director of Libraries at the University of Pennsylvania and a recognized expert on research libraries, stated:

The age-old mission of libraries is to select, organize, preserve, and provide access to recorded knowledge. In the past, the emphasis was on building local collections in print form; in the future it will be on providing access to knowledge regardless of form or physical location. The library function will become even more important in the electronic age than it was in the print age. In the electronic age information will be more ephemeral and will proliferate as never before, and the task of bringing it under control and providing access to it will become more difficult and more vital. Thus, the new information technologies will enhance the library's mission and capabilities.

It is in this context that the Rice library is approaching the future. The Fondren is now at that stage where it is in the fortuitous position of being "state-of-the-art" in automation, automated services (including providing access to off-site information through electronic means), information retrieval from remote sites, and implementation of programs which are designed to permit its various constituencies to explore and retrieve more efficiently and effectively its bibliographic wealth. The plans, policies, and targets of the Rupp Administration for the next five and ten years are being finalized, and the information and documentation requirements of Rice's future research and instructional programs are intimately involved in this planning process.

Given these considerations, policies governing the Fondren and its role are being refined and redefined in context with the new directions being charted for the University. A number of practical and philosophical issues are presently being addressed by the Rupp Administration. First and foremost, Rice will address itself to drawing up a university policy concerning information as well as the means for accessing and/or acquiring information. Fundamental questions in this area will include the complementary and interactive relationships evolving among the library, the computer center, the language laboratory, and the media center, central access points for identifying the information available on campus, the costs associated with obtaining information (e.g., what should be the financial obligations of Rice in providing funding to students and faculty in acquiring information from the "hidden" or electronic library whose access is remote and controlled by external organizations), etc. Connected to this last issue are the rapidly developing technologies regarding new storage media for and means of acquiring information. In this regard one of the more exciting developments concerns CD-ROM discs. A vivid example of this particular technology is the Fondren's recent acquisition on four, 4 3/4 inch laser-read discs of the full bibliographic records of three million titles cataloged by the Library of Congress. Rice will also become actively involved in the use of audio-visual material as a supplement to classroom instruction. And the recurring question of additional library space will again have to be addressed at a later date.

The preceding is but an incomplete list of the many issues confronting us as administrators, faculty, students, alumni and friends of Rice. Solutions will require the participation and support of all of us, and I personally look forward to the challenges which lie ahead for us. Again, I wish to express my deepest appreciation for your continuing generosity to and support of the Fondren Library. With warmest regards, I remain

Yours truly,
Sam Carrington

NOTIS - AN ONLINE TOTAL INTEGRATED SYSTEM FOR THE FONDREN LIBRARY

Anne Adler, Director, Processing Services

Jim Thompson, Associate Librarian

In June 1985, University Librarian, Samuel M. Carrington, signed an epoch-ending contract. The contract Dr. Carrington signed was with NOTIS, the company that developed and supports the software package of the same name (Northwestern Total Integrated System). The epoch that the signing of this contract ends is the card catalog.

The card catalog is cumbersome, destructible, labor-intensive. Card catalogs currently spread out all over the main public area of the library. People must thumb through the cards (and there are 3599 drawers of cards); unavoidably they smudge the print, dog-ear the cards, sometimes with loss of call number. An online catalog is efficient, the records it displays are not subject to wear and tear, and it is labor-saving for patron and staff.

Initially, there will be 48 terminals in the public and staff areas of the library, and, for outside users, 15 dial-up ports, which will be accessed through the campus phone switch. There will be 10 terminals in the main public area. Of these, 9 will be Telex 179 terminals, which will have screen printers attached. In addition, there will be a colored Telex 479L terminal with diacritics, and 29 ASCII terminals. Within two years, additional terminals will be located in the stacks.

The online public access catalog will be one of the first modules of NOTIS to become operational. At Northwestern, the online public access catalog is called LUIS (Library User Information System), and it has been in operation since 1980. At the Fondren Library, the online catalog will be called LIBRIS (LIBRARY Information System). LIBRIS brings together for the patron bibliographic and holdings information, call number, location, and circulating status.

LIBRIS can be searched by author, title, and subject. Later this year, keyword and Boolean searching will become available. By incorporating a commercial search software package into the system, keyword searching can be used on most fields of a bibliographic record, including content notes and all other general note fields. And such access can be qualified by Boolean search techniques. This enhancement to the search algorithms will make NOTIS the most sophisticated and powerful search technique available today.

Boolean logic was developed in the 19th century by George Boole, an English mathematician. It formulates requests into a series of relationships that can be understood by the computer and that identifies whether an item is present or absent from a given set.

There are three forms of Boolean logic: OR, AND, NOT. If a patron would like information on oil production in Great Britain, a search could be formulated using OR. The OR operator requires that at least one of the concepts or terms representing a concept be present in the citation retrieved. Enter GREAT BRITAIN OR ENGLAND OR UNITED KINGDOM, and material will be retrieved which contains any of the three words. If two or three of these terms appear in a single citation, the computer displays the citation only once. You can also use the OR operator to combine synonyms of the oil concept: PETROLEUM OR OIL.

The second Boolean operator, AND, requires both concepts to be present. Using GREAT BRITAIN AND OIL means that both terms must appear in the item for it to be retrieved.

The third Boolean operator, the NOT operator, is used to subtract a concept from a set: OIL NOT GASOLINE. The NOT operator must be used with care, because material dealing with both OIL and GASOLINE will not be retrieved, so pertinent material may be lost. Nor can Boolean logic guarantee that all the material retrieved will be pertinent. Items with both GREAT BRITAIN and OIL may be found in the search which are not related to each other in the manner that the searcher wants. He may be interested in oil production in Great Britain and get items on discovery of oil in the UK. Relevancy cannot always be expected.

Records are displayed in LIBRIS in catalog card format, which includes all descriptive information, call number, notes, and subject headings; copy and holdings data are also available, as well as circulating status. A periodical shows the latest issue received. If a single record is retrieved, that record displays. If multiple records are retrieved, a list of 17 brief author/title, title/author, subject heading/title/call number records is displayed, and the user picks the record he wants to see. There are help screens to instruct on the general use of the system and on particular search keys. It is an easy system to use with no sign-on and no derived search keys. It does have a simple command structure and system prompts.

In the new online system will be the bulk of the library's collection in machine-readable form. In 1981, the retrospective conversion project was begun, and only those main entries not converted (non-Roman alphabet material, selected microform sets, and some maps serials, scores, and sound recordings) remain in card form. Until the time when such a conversion is completed, these cards will be housed in an auxiliary catalog in the main public area.

All modules of the NOTIS integrated system will be used in the Fondren Library: acquisitions, serials control, cataloging, authority control, database management, and

LIBRIS SEARCH REQUEST: T=LIFE AND LETTERS OF THOMAS
BIBLIOGRAPHIC RECORD -- NO. 3 OF 9 ENTRIES FOUND

Huxley, Thomas Henry, 1825-1895.

Life and letters of Thomas Henry Huxley, by his son Leonard Huxley. London, Macmillan, 1900.

2 v. front., 1 illus., plates, ports., facsim. 22 cm.

LIBRARY HAS VOL. 1 ONLY.

SUBJECT HEADINGS (Library of Congress; use \$=):

Huxley, Thomas Henry, 1825-1895.

LOCATION: MAIN STACKS

CALL NUMBER: QH31.H9 A2

VOLUMES: v. 1

CIRCULATION STATUS: Circulation information not available in LIBRIS

TYPE m FOR NEXT RECORD.

TYPE i TO RETURN TO INDEX. TYPE e TO START OVER. TYPE h FOR HELP.

TYPE THE COMMAND AND PRESS ENTER

circulation. An integrated system means that a single record is used for all the subsystems noted above. This is a basic concept of the NOTIS system.

When a library decides to acquire an item, a bibliographic record is created. The record may be a full bibliographic record, or it may have only one or two lines of provisional data. A record can be created by keying in the information directly or by transfer to a NOTIS terminal from a bibliographic utility terminal (the library has belonged to OCLC since 1979).

This record remains in the system for use by all other modules, and any change made to the record is, therefore, reflected in the other modules. An order record is created by stripping information from the bibliographic record. Most of the data needed in a typical order record is default-supplied. Generally, only a vendor code, linked to an online vendor file, must be added. A code is assigned to each vendor in this file. When the operator keys in the code, the full address of the vendor is printed on all correspondence produced from the order record. A batch program prepares purchase orders which are ready to put in window envelopes.

At this point, the record, when called up on the public catalog terminal, will display the message "on order."

When the item is received, it is checked-in online. Payments are posted and the fund balance is also updated online. Printed lists of overdue orders, cancellations, returns are generated from a second basic concept of the NOTIS system: the action date. These dates are based on a library-assigned claiming period, as receipts are entered. Items with expired action dates are printed out so that the item can be claimed. After the item has been received, a code in the copy holdings statement is changed. This

record, when called up in the public access catalog, will now display the message "in process." So uncataloged items are accessible to the public.

The book is then sent on to the cataloging department to be processed. The original record initiated in the ordering process is called up. The cataloger edits the record or updates a minimal or provisional record by an overlay process from the OCLC database. The system speeds the keying necessary for record creation by allowing free-form entering of data and, even more importantly, by full screen transmission to the database rather than field-by-field transmission. As soon as the record is entered into the database, the author/title indexes are updated online. The system also automatically creates a copy holdings record when a bibliographic record enters the system. The bibliographic record contains information which pertains to all copies, while the copy holdings record has data specific to individual copies, such as location, call number, special handling, etc. The status code in this copy holdings statement is changed when cataloging is completed allowing the item to show as available to the public and adding all new subject headings to the subject index.

New headings are listed on a printout. These lists tell members of the Database Management Department that authority records may need to be made. Authority records give the form of a heading selected for the catalog and variant forms of that entry. For instance, from a real name to a pseudonym (from Amantine Lucile Aurore Dupin Dudevant to George Sand). Authority records are created and entries are organized into headings files just as bibliographic records are. These headings files can be used to make global headings changes. The new form of the name (George Sand) is entered into the field for the authorized

heading; the old form is entered into the field for a superseded entry. The global change is initiated online and run in a batch process offline. As many as 120 records can be changed in one minute. By the end of the year, cross references from this authority file will be displayed in the online catalog indexes in the public access catalog.

Now the item has been ordered, received, and cataloged. But the patron still wants to know shelf status. Is it available? Is it charged out? Is there a hold on it? NOTIS began at Northwestern University as an online circulation system in 1970, and it operated successfully until a redesign to make it state-of-the-art was carried out in 1982-1985. The new circulation system provides all the information to answer the above questions and more: control of fines and payments and reserve room control, which will allow charge-outs for days, hours, or minutes.

For each physical piece there is an item ID record; for each patron there is a patron ID record, and items are charged, renewed, or discharged by reading these two ID's. If an item that is being discharged is overdue, a fine notice is produced, and the fine is calculated by the system on the basis of format (journal, bound or unbound, or book), location, and patron status. The system also generates recall notices and hold notices, and when an item is returned, there is online, as well as offline, notice that it is again available.

As online total integrated systems go, NOTIS is a tried and proven system, a circulation system with 15 years behind it and a public access catalog with 5 years of activity. So, while NOTIS is ahead of other systems in system features and enhancements, it has a reassuring track record of excellent performance.

THE FRIENDS OF FONDREN LIBRARY

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December 1, 1985 - February 28, 1986

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CD IN '86: A TECHNOLOGY IN TRANSITION

Ralph Holibaugh, Assistant University Librarian for Administration

If asked, "What's a CD?", many of you would answer without hesitation, "Certificate of Deposit." A growing number, however, might add, "Or Compact Disc."

Walk into almost any "record shop" these days and you'll see a sizeable selection of thin, smallish plastic cases, each containing a 4.75 inch plastic coated aluminum disc - smaller than the old 45s. Only one side of the disc is used, but that side may hold up to 74 minutes of music, enough for Beethoven's entire Ninth Symphony, which normally requires both sides of an LP. Instead of using the familiar grooves, compact discs capture music by means of a process called digital encoding, the translation of sound into binary digits (bits) of 1s and 0s, similar to the binary coding of computers. A laser beam 'imprints' the bits into the disc by burning microscopic pits on its surface. Playing the CD requires a reader which focuses a laser beam on the disc's tracks. The light beam is reflected differently from the pits than from the unpitted areas, the two states of reflected light corresponding to the binary 1s and 0s in digital information. This optical scanning means that CDs don't deteriorate or wear out after repeated playings and their plastic exterior means that they aren't fragile or easily damaged. The result is extremely high quality stereophonic sound without surface noise, tape hiss, rumble, wow and flutter or most of the other arcane designations of imperfection associated with traditional sound recordings.

Americans will purchase 1 million compact disc players and 21 million CDs in 1986¹! Because of wide consumer acceptance and mass production, the cost of CD players has dropped dramatically from \$1000, when the technology was introduced to the public in October 1982, to retail discount prices well under \$185. In spite of competing with well established media like LPs and cassette tapes, industry analysts predict that CDs will surpass the competition by 1990, and continue to hold market supremacy five years later. In two years CD players have achieved the same sales figures the video cassette recorder took six years to attain. Hardware and software sales climbing 500-600 percent annually reflect billions of dollars in sales.

But the first quarter of 1986 has confirmed that the music CD is only one facet of a technological application whose potential has been compared to the revolution fostered by Gutenberg's movable type.

A more precise abbreviation for the discs described above is CD-ROM, an acronym for compact disc as read-only-memory. As its name implies, the contents of CD-ROMs cannot be altered, updated or erased. Music or audio CDs represent a specific application of CD-ROM development, which is itself a subset of the larger area of high density storage, optical disc technology.

In spite of its size, the CD-ROM can store huge amounts of digital data because of the microscopic dimensions of its laser imprinting. A "typical" microcomputer's memory is 256 K (256,000 bytes) while the capacity of a CD can range from 550 to 730 MB (730,000,000 bytes), which is more storage than many mainframe computers have on-line. In fact, at the upper end of this range the capacity of a CD-ROM is equivalent to about 1500 floppy discs, more than 100,000 single-spaced typed pages, or 5.3 days of continuous data transmission at a telecommunications speed of 1200 baud.

In the last 5-6 months CD-ROM products containing bibliographic data have appeared with increasing regularity. In late 1985 Digital Equipment Corporation (DEC) began distributing ten major science/technology databases². In February of this year the Disclosure Information Group offered *Compact Disclosure*, a CD-ROM containing financial information abstracted from reports filed by 10,150 companies with the Securities and Exchange Commission and five-year financial summaries for each company. Software to analyze the information is included. Databases such as *Aquatic Sciences & Fisheries Abstracts*, *Life Sciences* and *Medline* are now available from Cambridge Scientific Abstracts on CD-ROM. By summer, a number of CD-ROM databases will be available from SilverPlatter Information Inc³. One of these, *PsycLIT*, a new database developed by the American Psychological Association, is notable. While the typical "work station" configuration of microcomputer plus optical disc (CD-ROM) drive will be used, the search software will be recorded on the disc with the data files and not on a separate floppy disc. For the experienced operator, the software will support Boolean logic, proximity searching, free-text or specified-field searching and truncation. It is significant, however, that menu screens with built-in help functions will also be available for the novice. This means that SilverPlatter envisions both librarians and library users querying the CD-ROM databases.

Three months ago the Fondren Library purchased The Library Corporation's *BiblioFile*, a "Catalog Production System" which incorporates a CD-ROM reader or drive, a personal computer and connecting software. The two accompanying CDs contain over 1,400,000 Library of Congress machine-readable (MARC) bibliographic records of English language cataloging since 1964 as well as popular titles since 1900. A third disc containing LC's foreign language MARC records makes a total of 3 million records available. Over a billion characters of data and indexes are packed into 600 MB on one disc and there is still space for another 130 MB. The database is presently recompiled, reindexed and republished quarterly or monthly, with weekly updates being discussed. Not to be outdone, the three year Disc Distribution Pilot Project of the Library of Congress is exploring the feasibility of using some form of optical media to permanently distribute LC

MARC cataloging data. Other library applications include a book acquisitions system, a serials control system, and even a local public access catalog.

The project recently initiated by University Microfilms International (UMI) also has several significant features. Both CD-ROM and 12-inch optical disc databases are being tested for storage of bibliographic citations as well as text. UMI's prototype products include the 1984 issues of 42 journals of the Institute of Electrical and Electronics Engineers, an index extracted from the INSPEC database and the *Dissertations Abstracts* database. By adding telecommunications peripherals to its work station environment, UMI anticipates combining remote and local database searching. Like a vending machine, the work station will charge users each time an article is printed from a disc. Thus, the optical disc product is viewed as a support system to online remote access.

Perhaps the best known example of textual CD-ROM publishing is Grolier's recent release of the *Academic American Encyclopedia*, which has been available on videodisc for some time. The CD-ROM format, Grolier's first optical disc product targeted for home information use, sells for \$199. One disc contains the entire 21-volume, 9-million-word reference work. In addition to a conventional index arranged by topics, there is a complete index and cross-reference to every word in the encyclopedia. Access to any one of the 30,000 articles is via a screen menu which allows for a search on any word or word combination, using the index as a tool to discover new relationships among data. This relational searching of more than 140,000 words is completed in less than three seconds. Text, indexing and search software utilize only about 20% of the disc's capacity.

It comes as no surprise that the rapid growth of CD-ROM databases and non-music data products has already reached a point where guidebooks and journals such as *Optical/Electronic Publishing Directory*⁴ and *Optical Information Systems Update/Library & Information Center Applications*⁵ can be justified.

In fact, industry growth has been so rapid that the lack of available drives was a serious problem for software marketing in 1985. In response, Grolier and many other publishers and vendors now bundle the hardware and software together in sales or lease purchase arrangements. Not to be confused with the audio CD players, these drives have appeared most often as stand-alone units over the past several months, but drives used as storage devices for many brands of personal computers -- including those of DEC, mentioned above -- will appear more frequently throughout 1986. Hitachi, North American Philips, Sony, Panasonic and Denon America have announced that they will be distributing drives which many estimate will sell for around \$1000 initially, but will rapidly fall to about \$600 to \$800, or roughly the difference between Grolier's encyclopedia-on-CD and the printed and bound version of the same work at \$450 to \$650. Nice marketing.

Speaking of the Grolier encyclopedia, what about all

that unused space on the disc? The answer may be that the company plans to use that space for non-text applications in later releases. From the inception of optical disc research, innovative electronics manufacturers in Japan and Europe have recognized other potential uses for inexpensive replication of many kinds of information. As a result of their early collaboration, Philips and Sony, two of the companies that developed the technology, have *de facto* created an international standard for the CD's physical characteristics. With admirable foresight, the present industry standard allows for future expansion into over 250 application modes. Digitally encoded sound was the first mode, followed by digital computer data. The international standard for CD-ROM physical formatting allows for the selection of yet other modes, such as moving and still (subcode) graphics, digitized images -- over 6,600 frames of video images with 730 MB capacity -- and even audio, all on the same CD. Both the Panasonic and Toshiba corporations have released "dual-mode" drives that read CD-ROM data discs and play standard audio CDs, and Sony is distributing a subcode decoder which links a CD drive to a TV.

If multi-media CD-ROM sounds years away, it's not. The popular comedy group, Firesign Theatre, has already released *Eat or Be Eaten — The Game*, claimed to be the world's first full-range use of CD-ROM in a game format. It combines audio clues, "interactivity" with the disc by choosing the sequence of tracks, subcode graphics and printed materials. It may turn out to be the first software offering for the so-called Compact Video (CV) machine, a multimedia CD player with a built-in computer.

Another almost anachronistic development may be seen in the starkly mechanical means being used to extend storage capacities. Once again, manufacturers of audio CD players are leading the way. Toshiba offers a two-disc player and Pioneer has announced a six-disc home CD changer with wireless remote control that can play as many as 32 programmed selections in any order from any of the six discs. For less than \$2000, the Technics micro-computer-controlled, toaster-size jukebox that holds and mounts any of 50 discs or the 60-disc changer from Nikko is available. The last unit can be fiber-optic linked to other identical units, expanding program access to as many as 240 discs. In addition, the Nikko CD changer can be interfaced with CD-ROM.

If the remarkable outpouring of hardware and software products and options seems chaotic and uncoordinated, to a great extent it is. The argument of some is that the general absence of standards encourages developers and manufacturers to continually seek improvements in technology. But even in the area of standards development, things are changing rapidly. In the past several months a number of groups have been working to specify a logical file structure that will enable electronic publishers to master a single compact disc and know that replicated copies will be readable on most players, computer hardware and computer operating systems.

Throughout the remainder of the year we can expect to see a greater variety of data as well as audio CDs now that more American production facilities are being built⁶. We can expect announcements regarding further CD-ROM developments: write-once, erase-once, and ultimately, multiple write and erase capabilities. This year brings with it more than new entertainment products and electronic games. Optical storage devices will be developed to the level of mass-marketed products. The CD-ROM, perhaps an initial phase, but surely not the culmination of optical storage media, is prompting the first widespread re-evaluation of optical alternatives to floppy discs in particular and magnetic media in general.

From a socio-economic perspective, reasonable alternatives to the functions and costs associated with on-line access to information, particularly telecommunications charges, now exist. The nature of database vending and its interaction with traditional scholarly publishing has already begun to change substantially. Moreover, the inexpensive little plastic discs with sounds and pictures and data that can be altered and transmitted electronically in the near future are most certainly going to generate even more discussion of the effectiveness of copyright laws and the practical difficulty of concepts like intellectual property. In the largest sense perhaps, as the Information Age matures and greater economic values are attached to the generation, control and distribution of information, the little discs may play a surprisingly large role in the continuing redistribution of the world's wealth.

Notes

1. Stephen Koepp, "The Bright New Sound of Music," *Time* (July 1, 1985) 38-39.
2. DEC databases include: 1) Engineering Information's **COMPENDEX: Aerospace Engineering**; 2) **COMPENDEX: Electrical and Computer Engineering**; 3) **COMPENDEX: Chemical Engineering**; 4) National Technical Information Service's **NTIS: Computers, Communications, and Electronics**; 5) **NTIS: Environmental Health and Safety**; 6) **NTIS: Medicine, Health Care, and Biology**; 7) **NTIS: Aeronautics, Aerospace, and Astronomy**; 8) **Chemical Abstracts: Health and Safety in Chemistry**; 9) **Royal Society of Chemistry: Current Biotechnology Abstracts**; and 10) **Fraser Williams: Fine Chemicals Directory**.
3. SilverPlatter's databases include the **Educational Resources Information Center (ERIC)**, **Excerpta Medica (EMBASE)**, from Elsevier Science Publishers, the **Public Affairs Information Services (PAIS) Bulletin** and **PAIS Foreign Language Index**, **Library and Information Science Abstracts (LISA)** and **AV Online** (formerly the **National Information Center for Educational Media, NICEM**, database).
4. Available from Richard A. Bowers, **Information Arts**, P.O. Box 1032, Carmel Valley, CA 93924; (408) 659-5135.

5. A bimonthly publication by Meckler which began with a January/February 1986 issue.
6. America's first CD-ROM production facility, Sony's plant in Terre Haute, Indiana, is now competing with 3M's optical disc plant in Menomonie, Wisconsin, which claims a three-day turnaround time on orders. A similar plant has been announced for Texas.

The following works, selected from those consulted in the preparation of this article, are recommended to those readers seeking additional information:

Brewer, Bryan and Key, Edd. "Eat or Be Eaten: The World's First CD With Pictures," *Digital Audio*, (Nov. 1985) 11.

Brownrigg, Edwin B. and Lynch Clifford A. "Electrons, Electronic Publishing, and Electronic Display," *Information Technology and Libraries*, (Sept. 1985) 201-7.

"Database Publishers Go CD-ROM Route with DEC," *Information Today*, (Nov. 1985) (1).

Gale, John C. "The Information Workstation: A Confluence of Technologies Including the CD-ROM," *Information Technology and Libraries*, (June 1985) 137-39.

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Koepf, Stephen. "The Bright New Sound of Music," *Time*, (July 1, 1985) 38-39.

Melin, Nancy. "CD-ROM, Micros Dominate ALA Exhibits" *Information Today*, (March 1986) 13.

"New Technology for the Library Microcomputer: Libraries and CD-ROM: A Special Report," *Small Computers in Libraries* (April 1985) 7-10.

"Retail Stores to Peddle Encyclopedia on CD-ROM," *Information Today*, (Feb. 1986) 4.

Rosenberg, Victor. "The Scholar's Workstation," *College & Research Libraries News*, (Nov. 1985) 546-49.

Schwerin, Julie B. "The Importance of CD-ROM Standardization," *Information Today*, (Dec 1985) 5.

Schwerin, Julie B. "The Optical Family Tree: Structure and Applications," *Information Today*, (July/August 1985) 16.

Schwerin, Julie B. "What to Expect from Laser Discs," *Information Today*, (May 1985) 6.

Tenopir, Carol. "Databases on CD-ROM," *Library Journal*, (March 1986) 68-69.

"Videodiscs and CD-ROM at ALA," *Library Systems Newsletter*, (August 1985) 57-62.

I wish to thank Travis Franklin for his special assistance.

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